



US006097251A

United States Patent [19][11] **Patent Number:** **6,097,251****Khullar et al.**[45] **Date of Patent:** **Aug. 1, 2000**[54] **PRE-RECORDED SIGMA DELTA VALUES
FOR POWER AMPLIFIER CONTROL**[75] **Inventors:** Anders Khullar, Bjärred; Lars
Gunnar Torbjörn Graham; Karl
Håkan Torbjörn Gärdenfors, both of
Malmö; Sven Hans Sebastian
Sedvallson, Lund, all of Sweden[73] **Assignee:** Telefonaktiebolaget LM Ericsson,
Stockholm, Sweden[21] **Appl. No.:** 09/086,565[22] **Filed:** May 29, 1998[51] **Int. Cl.⁷** **H03G 3/20**[52] **U.S. Cl.** **330/129; 455/126**[58] **Field of Search** 330/129, 138,
330/279; 455/126, 127; 375/247; 341/144[56] **References Cited****U.S. PATENT DOCUMENTS**

4,270,027	5/1981	Agrawal et al.	179/81 R
4,992,753	2/1991	Jenson et al.	330/129
5,057,840	10/1991	Ledzius et al.	341/144
5,079,551	1/1992	Kimura et al.	341/143
5,117,234	5/1992	Shizawa	341/143
5,159,283	10/1992	Jensen	330/129
5,225,835	7/1993	Majima et al.	341/143
5,245,297	9/1993	Claydon et al.	330/129
5,245,345	9/1993	Kohdaka et al.	341/152
5,302,913	4/1994	Hori	330/129
5,323,157	6/1994	Ledzius et al.	341/143
5,349,353	9/1994	Zrilic	341/144
5,369,789	11/1994	Kosugi et al.	455/126

5,396,244	3/1995	Engel	341/143
5,416,441	5/1995	Nagano	330/129
5,489,903	2/1996	Wilson et al.	341/144
5,504,457	4/1996	Jensen	330/129
5,524,285	6/1996	Wray et al.	455/126
5,541,600	7/1996	Blumenkrantz et al.	341/139
5,565,930	10/1996	Bolger et al.	348/572
5,592,165	1/1997	Jackson et al.	341/144
5,621,172	4/1997	Wilson et al.	73/579
5,621,407	4/1997	Jeong et al.	341/143
5,701,106	12/1997	Pikkarainen et al.	332/100
5,712,635	1/1998	Wilson et al.	341/144
5,748,126	5/1998	Ma et al.	341/144
5,754,591	5/1998	Samueli et al.	375/235
5,856,799	6/1999	Hamasaki et al.	341/144

FOREIGN PATENT DOCUMENTS

2 281 461 3/1995 United Kingdom .

Primary Examiner—Robert Pascal*Assistant Examiner*—Khanh V. Nguyen*Attorney, Agent, or Firm*—Burns, Doane, Swecker &
Mathis, L.L.P.[57] **ABSTRACT**

In order to increase the resolution of signals input to a power amplifier, this system includes a power control circuit which utilizes sigma delta modulated values which are stored in a memory device. These values, after retrieval from an addressable memory, are supplied only to a low pass filter before being sent to the control input of the power amplifier. The use of sigma delta modulated values can result in a reduction of hardware within the power control circuit of communication devices and increase the signal resolution by moving noise elements from the signal.

14 Claims, 4 Drawing Sheets